

## Amended Sheet (Article 34)

a transcriptional factor SF-1 was expressed (Example 5). Therefore, the inventors prepared a KUM9-derived strain, wherein SF-1 is expressed constitutively, and added a stimulation by cAMP, then the inventor found that the KUM9-derived cells stably produced steroid hormone (Examples 1 and 2). Moreover, it was confirmed that not only a gonadal steroid hormone-producing enzymes but also adrenal steroid hormone-producing enzymes are induced in a human cell line (Example 3). It is expected that these results are fundamental data in using differentiation of stem cells for medical treatment of human steroid hormone deficiency and provide a useful method for regeneration treatment.

From the above results, the inventors discovered that stimulation of mesenchymal stem cells by a transcriptional factor (SF-1), preferably with SF-1 and cAMP, enabled to differentiate the mesenchymal stem cells into steroid-producing cells and accomplished the present invention.

Namely, the present invention is a method for differentiating mesenchymal stem cells into steroid hormone-producing cells, comprising stimulating the mesenchymal stem cells by a transcriptional factor (SF-1). Furthermore, said method may comprise further stimulating the mesenchymal stem cells by cAMP.

The mesenchymal stem cells are preferably derived from bone marrow and said mesenchymal stem cells are preferably human cells.

Still furthermore, the present invention is a method for producing steroid-producing cells, comprising producing steroid producing cells by implementing said method in vitro or by transplanting the mesenchymal stem cells into a mammalian reproductive organ.

Moreover the present invention is steroid-producing cells or non-human animals containing said steroid-producing cells obtained by these method.

Advantages of the present invention

The present invention provides, for the first time, a method for differentiating mesenchymal stem cells into steroid hormone-producing cells.

It will be possible to obtain a large amount of differentiated cells by transplanting stem cells into a genital gland of a non-human animal such as swine, if immune difficulties were overcome. The most important issue in regeneration medicine and